

**Definition**

Normal vaginal bleeding occurs with the female ovulatory cycle beginning with the *menarche*, or onset of menses, which generally occurs at 10 to 15 years of age. It ends with the *menopause*, or cessation of menses, generally between age 45 and 50 years.

Abnormal vaginal bleeding may occur in association with or independent from menstruation. Bleeding related to the cycle may be abnormal in timing, duration, or quantity. *Polymenorrhea* (frequent menses) refers to a menstrual interval of less than 21 days. In *oligomenorrhea* (infrequent menses) the interval is greater than 37 days but less than 90. *Amenorrhea* (absence of menses) refers to failure to menstruate for 90 days or longer. *Metrorrhagia* is an increased duration of menstrual flow beyond 7 days and continuous with the cycle. *Intermenstrual bleeding* occurs between menses, discontinuous with the cycle. *Hypomenorrhea* is the term for abnormally low bleeding, substantially less than 30 ml per menstrual cycle, and *hypermenorrhea* refers to excessive bleeding, over 90 ml, in a cycle of normal duration.

The history should determine the following information:

- Premenarchal bleeding, which may be associated with precocious puberty (bleeding before the age of 9 years)
- Onset and cessation of menses
- The characteristics of the menstrual cycle: interval, duration, amount of flow, last monthly period
- Postcoital bleeding (any bleeding after intercourse or in association with douching)
- Postmenopausal bleeding (any bleeding occurring in the postmenopausal female)

**Technique**

Many associated findings in the history and physical examination must be evaluated in order to determine the etiology of abnormal bleeding. The basic general complete gynecologic history and physical examination will be extremely helpful. Ask about associated pain, discharge, bladder symptoms, nausea and vomiting, fever, infertility, and other history points. During the physical examination look for such conditions as abnormal phenotype breast development, abnormal hair distribution, thyroid enlargement, abdominal distention and tenderness, and hepatomegaly. Look for pelvic tumor, cervical lesions, polyps, and tenderness on the pelvic examination. Special diagnostic procedures such as hormonal assays, visual field tests, chest x-rays, laparoscopy, vaginal cytology, colposcopy, ultrasonography, culdocentesis, endometrial curettage, pelvic examination under anesthesia, and many others are helpful.

Menstruation usually begins at age 10 to 15. Young girls who have not menstruated before age 15 or who have vagi-

nal bleeding before age 10 should be suspected of having gynecologic disease. Menarche usually appears 1 or 2 years after thelarche, or breast development.

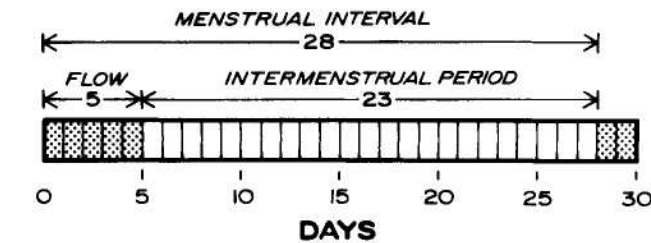
The menopause with associated symptoms and cessation of menses usually occurs at age 45 to 50. A patient who is still menstruating regularly at age 52 should undergo dilation and curettage (D and C) even if she is asymptomatic. A patient who has stopped her menses for 6 to 12 months, then begins again to have vaginal bleeding, should have a careful examination. If the examination does not reveal a gross neoplasm of the cervix, then a D and C must be done.

Begin the evaluation by asking the patient about the onset of menses, then determine if the patient has ceased menstruation. Three clinical characteristics of cyclic menstruation should be recorded for the adult patient:

1. *The menstrual interval (length of cycle).* The menstrual interval is counted from the first day of one flow to the first day of the next flow (ordinarily 26 to 30 days). The definition of a normal menstrual interval is 21 to 37 days. Therefore menstruation occurring more frequently than 21 days is considered abnormal (polymenorrhea), and menstruation occurring less frequently than every 37 days is considered abnormal (oligomenorrhea). If menses has been absent for 90 days, the patient is said to have amenorrhea.
2. *The duration of flow.* This is usually 3 to 5 days, but a duration of 7 days is still considered normal. If the duration of flow is greater than 7 days, the patient is said to have metrorrhagia (bleeding beyond the normal duration of flow and into the intermenstrual period). The intermenstrual period is counted from the last day of one flow to the first day of the next flow. Therefore metrorrhagia and intermenstrual bleeding are synonymous. In practical usage these terms are distinguished from each other depending on whether the bleeding is continuous into the intermenstrual period (metrorrhagia) or discontinuous into the intermenstrual period (intermenstrual bleeding). This is explained in Figure 173.1.
3. *The amount of flow.* This is more difficult to define. The normal amount of blood lost with each menstrual flow is 30 to 50 ml. There is no practical way to measure the amount of flow, however, and its evaluation is therefore rather subjective. Menorrhagia and hypermenorrhea refer to an increase in the amount of menstrual flow to 90 ml or more. Hypomenorrhea refers to a decrease in the amount of menstrual flow to substantially less than 30 ml per cycle.

It is important to ask the patient specifically about her last period. Many patients will assume that the occurrence of any bleeding episode is a "period." Failure to make this distinction can result in misleading information.

The date of the last menstrual period should be included



#### ABNORMAL MENSTRUAL INTERVAL

1. **POLYMENORRHEA** (frequent menses) – Menstrual interval less than 21 days.
2. **OLIGOMENORRHEA** (infrequent menses) – Menstrual interval greater than 37 days and less than 90 days
3. **AMENORRHEA** – Absence of menses for any period greater than 90 days.

#### ABNORMAL DURATION OF FLOW

1. **METORRHAGIA** – Increased duration of flow beyond 7 days (continuous).
2. **INTERMENSTRUAL BLEEDING** – Bleeding in the intermenstrual period (discontinuous).

**Figure 173.1**

Terms denoting abnormal menses.

in the database of all female patients. Record the date that the menstrual flow began. Therefore, simply asking a patient, "When was your last menstrual period?" is not sufficient. Ask instead, "When was the first day of your last menstrual period?" Also record the duration of flow in the number of days. The date of the previous menstrual period should be recorded with the duration of flow. Then ask the patient if these periods were normal. Any deviation from normal should be recorded. Whenever the database is updated, the date of the last menstrual period should also be updated.

Ask the patient if there is any evidence of bleeding after intercourse or in association with douching.

The significance of a variety of gynecologic complaints and findings changes tremendously with menopause. Any complaint of vaginal bleeding after menopause is considered abnormal. No matter how slight the bleeding, always consider this abnormal and investigate.

### Basic Science

The inception of menses (menarche) depends on the previous development of normal puberty. Menarche is the latest event in puberty. The mechanisms responsible for the start of puberty, and for the resulting menarche, are to a great extent unknown. Puberty is associated with an increased secretion of gonadotropin-releasing hormone (GnRH) from the hypothalamus, and consequent increased secretion of the gonadotropins follicle-stimulating hormone (FSH) and luteinizing hormone (LH) from the adenohypophysis. This results in increased secretion of estrogens (mostly estradiol-17 $\beta$ , some estrone) from the ovary. Finally, cyclic secretion of GnRH, FSH, and LH is established, and in consequence cyclic secretion of estrogens and progesterone by the ovaries occurs. As a result of this, the endometrium undergoes cyclic stimulation and menses start.

On the first day of the normal menstrual cycle, plasma levels of FSH, LH, estrogens, and progesterone are rela-

tively low. Plasma estrogens rise slowly during the first 12 days and then more abruptly around the thirteenth to fifteenth day, producing a midcycle peak. The level then diminishes somewhat, to rise again about the twenty-second day to form a second (luteal) peak, and fall finally to low levels as the menstrual flow starts again. Plasma FSH and LH are also low during the menstrual flow and remain low until the thirteenth to fifteenth day of the cycle, when there is a sharp and abrupt rise in concentration which rapidly subsides (midcycle peak). This peak appears to follow the midcycle estrogen peak by some hours. There is a single peak for both FSH and LH. Plasma progesterone remains low until after the midcycle. The concentration then rises to form a broad luteal peak corresponding to the luteal estrogen peak, and falls to low levels as the menstrual flow starts. The midcycle peak of gonadotropins appears to be responsible for ovulation, and the luteal estrogen and progesterone peaks correspond to the formation of and secretion by the corpus luteum. The elevation of plasma estrogens during the first part of the midcycle estrogen peak is thought to trigger the gonadotropin peak, with subsequent ovulation.

The menopause can be regarded as physiologic ovarian failure. For reasons unknown, the ovary ceases to respond to gonadotropin stimulation at around the age of 45. Plasma estradiol-17 $\beta$  is low, and since there is no ovulation, plasma progesterone remains low. The endometrium is, therefore, not stimulated and there are no menses. Plasma FSH and LH are greatly elevated and remain so for many years.

### Clinical Significance

A variety of gynecologic problems is associated with abnormal menstruation. Invasive cervical cancer may cause menometrorrhagia or postcoital bleeding, or both. Tubal pregnancy may cause oligomenorrhea followed by metrorrhagia. Uterine myomas, pelvic endometriosis, pelvic inflammatory disease, adenomyosis, and dysfunctional uterine bleeding may cause menorrhagia. Adenomatous endometrial hyperplasia and endometrial adenocarcinoma may cause postmenopausal bleeding. Functioning ovarian tumors may cause a variety of menstrual abnormalities, depending on the hormone produced by the tumor. Normal intrauterine pregnancy is the most frequent explanation for oligomenorrhea followed by amenorrhea.

If bleeding occurs before the other signs of puberty, one must include the possibility of malignancy, foreign body in the vagina, or other trauma.

Healthy adult females usually menstruate normally. However, a patient cannot be guaranteed a complete state of health simply because her menstruation is normal, even though women who menstruate normally usually feel better and think of themselves as healthy. On the other hand, the patient is likely to consider abnormal menstruation a sign of ill health. It may be a manifestation of either a general medical disease or a specific gynecologic problem. For example, oligomenorrhea and amenorrhea may be associated with hypothyroidism, or the same menstrual problem may be associated with tuberculosis. Thrombocytopenia may be associated with menorrhagia or metrorrhagia, or both.

The amount of flow is very important to determine. When measured accurately, the average seems to be around 30 ml per menstrual cycle but varies among otherwise normal patients up through 90 ml. A careful history must be ob-

tained for the flow to be properly evaluated. It is important to ask specifically about the patient's last menstrual period. The patient may not understand whether or not her flow is normal because she has no basis for comparison. Her impression of her flow and whether it is light, normal, or heavy is important from the standpoint of knowing how she feels about herself, however. Additional helpful questions are: How many tampons or pads do you use on the heaviest day of your flow? How well soaked are these tampons or pads? A patient who is very fastidious about her menstrual flow may change pads when there is just the slightest sign of staining. She may actually use as many as 10 or 12 tampons or pads per day but lose less blood than another patient who uses only 4 pads per day but does not change pads until they are soaked from corner to corner. Patients who bleed very heavily may also state the necessity for using two tampons or pads at a time or sheets or towels.

The passage of definite aggregates of red blood cells, or "clots," is significant and indicates heavy bleeding. Ordinarily if the menstrual flow can be controlled with the use of vaginal tampons alone, one can assume that the menstrual flow is not too heavy.

A patient may have a heavy menstrual flow with a normal hemoglobin and hematocrit value. Excess menstruation may result in iron deficiency, but iron deficiency anemia is a late manifestation of excessive menstrual flow. Therefore, a history of excessive menstrual flow should be not discounted simply on the basis of a normal hematocrit value.

### Reference

Kistner RE, ed. *Gynecology principles and practice*. 3rd ed. Chicago: Year Book Medical Publishers, 1979.